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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/940,818	08/28/2001	Rene Monshouer	NL 000771	6674

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EXAMINER

STOCK JR, GORDON J

ART UNIT PAPER NUMBER

2877

DATE MAILED: 06/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/940,818

Applicant(s)

MONSHOUWER ET AL.

Examiner

Gordon J Stock

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 August 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>20010828</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

1. Preliminary Amendment filed August 28, 2001 has been entered into the record.

Drawings and Specification

2. Specification is objected to for the following: on page 17 line 12 "b_{p10}(-1)" should read --b_{p11}(-1)--; on page 18 line 23 "Fig. 4" should read --Fig. 7--. Corrections required.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference character(s) mentioned in the description: 4 of Fig. 3; P_c of Fig. 7. Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: O₁, O₂, 8, 9, 10, 14, 17, 18, 19, 20, 21, 22, S_a, V_b, 24, 55, and 56 of Fig. 3; 80-86 and ΔET of Fig. 7. Corrected drawing sheets, or amendment to the specification to add the reference character(s) in the description, are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement

Art Unit: 2877

sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. **Claims 5-7 and 8** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. **Claims 5-7** (claim 6 depending from claim 5) provides for the use of an off axis and on axis alignment device, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claims 5-7 (claim 6 depending from claim 5) are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Art Unit: 2877

Claim 8 is rejected for the phrase “one set of the following successive steps” is indefinite, for it is unclear as to how many steps comprise a ‘set’ and it is unclear if the term ‘set’ encompasses consecutive and/or nonconsecutive steps.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. **Claim 8** is rejected under 35 U.S.C. 102(a) as being anticipated by **Wu (6,278,116)**.

As for **claim 8**, Wu in a method of monitoring deep uv exposure system discloses the following set of method steps: aligning a mask provided with at least one overlay mark with respect to a first substrate; imaging by exposure radiation the overlay mark in a resist layer on the substrate (Fig. 2; col. 1, lines 45-67; col. 2, lines 1-20).

10. **Claim 8** is rejected under 35 U.S.C. 102(e) as being anticipated by **Yin et al. (6,727,989)**

As for **claim 8**, Yin in an enhanced overlay measurement marks for overlay alignment and exposure tool condition control discloses the following set of method steps: aligning a mask provided with at least one overlay mark with respect to a first substrate; imaging by exposure radiation the overlay mark in a resist layer on the substrate (col. 3, lines 9-30).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. **Claims 1-3, and 5** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Everett et al. (5,808,742)** in view of **Yamashita et al. (5,252,414)**.

As for **claims 1-3 and 5**, Everett in an optical alignment apparatus having multiple parallel alignment marks discloses the following: that the method of aligning maybe done in a lithographic projection apparatus that comprises x-ray lithography (col. 2, lines 58-60); an alignment measuring device is used (Fig. 11); and that a plurality of gratings, mask, reference mask and reference substrate, and substrate grating marks are used to interfere with each other to provide interference patterns, moiré fringes, for alignment purposes; and that relative differences between the patterns formed by the various grating pairs are determined to determine alignment offset (Fig. 12-13). The periodic structures, pitches, of the various gratings may be of a plurality of values as long as they follow a set equation (col. 5, lines 60-67; col. 6, lines 5-20 and lines 60-67; col. 7, lines 1-10) suggesting that periods may have differing and similar magnitude pitches as long as they obey the grating equations such as one grating having substantially larger periods than other gratings or substantially equal pitches compared to others. As for a separate substrate and resist mark Everett suggests that there are marks of differing level due to diffraction efficiency changes due to processes such as adding layers to the substrate (col. 10, lines 20-25). In addition, Yamashita in an evaluation method of resist coating teaches that marks

Art Unit: 2877

comprise part of the resist layer (Figs. 1a-1c). Therefore, it would be obvious to one skilled in the art that there the plurality of marks on the substrate gm1-gm4 comprise resist marks for marks provided on substrate for overlay measurement marks comprise part of the resist layer. Everett uses an on-axis alignment system (co. 2, lines 40-45; Fig. 11).

13. **Claims 4 and 7** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Everett et al. (5,808,742)** in view of **Yamashita et al. (5,252,414)** further in view of **Hirukawa et al. (5,402,224)**.

As for **claims 4 and 7**, Everett in view of Yamashita discloses everything as above (see **claim 1**). Everett is silent concerning latent marks or off axis alignment devices. However, Hirukawa in an inspection method for a projection optical system teaches using latent marks and off axis alignment systems for alignment purposes using interference patterns(col. 15, lines 64-67; col. 16, lines 1-15). Therefore, it would be obvious to one skilled in the art to have the method comprise using latent marks and off-axis alignment device, for off-axis alignment devices use latent marks for alignment with interference patterns.

Allowable Subject Matter

14. **Claim 6** would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, and 35 U.S.C. 101 set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

As to **claim 6**, the prior art of record, taken alone or in combination, fails to disclose or render obvious in a method of measuring overlay “the interference pattern is imaged on a mask alignment mark via an optical filter, which selects diffraction orders of the radiation from the overlay marks to process to said mask alignment mark (whereas, Everett filters after interference

Art Unit: 2877

between the gratings on the mask and substrate—see Fig. 11), in combination with the rest of the limitations of **claim 6**.

Fax/Telephone Numbers

If the applicant wishes to send a fax dealing with either a proposed amendment or a discussion with a phone interview, then the fax should:

- 1) Contain either a statement “DRAFT” or “PROPOSED AMENDMENT” on the fax cover sheet; and
- 2) Should be unsigned by the attorney or agent.

This will ensure that it will not be entered into the case and will be forwarded to the examiner as quickly as possible.

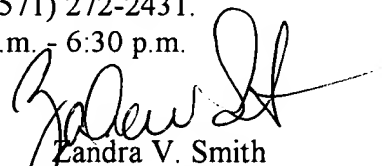
Papers related to the application may be submitted to Group 2800 by Fax transmission. Papers should be faxed to Group 2800 via the PTO Fax machine located in Crystal Plaza 4. The form of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CP4 Fax Machine number is: (703) 872-9306

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gordon J. Stock whose telephone number is (571) 272-2431. The examiner can normally be reached on Monday-Friday, 10:00 a.m. - 6:30 p.m.



gs

June 10, 2004


Zandra V. Smith
Primary Examiner
Art Unit 2877